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|---|--|---|--|--------------------------|--|----------------|--|
| FLIGHT PAYLOAD STANDARDIZED HAZARD CONTROL REPORT | | A. NUMBER | | B. PHASE | | C. DATE | |
| | | STD- AMS-02-F01 | | Phase II | | March 31, 2006 | |
| D. PAYLOAD, DTO, DSO or RME <i>(Include Part Number(s), if applicable)</i> | | HAZARD TITLE | | | E. VEHICLE | | |
| Alpha Magnetic Spectrometer –02 (AMS-02) (Exterior Elements) | | STANDARD HAZARDS | | | Shuttle/Station | | |
| F. DESCRIPTION OF HAZARD: | | G. HAZARD CONTROLS: <i>(complies with)</i> | | H. APP. | I. VERIFICATION METHOD, REFERENCE, AND STATUS: | | |
| 1. Structural Failure <i>(payloads must comply with the listed requirements for all phases of flight)</i> <i>Note: Locker and Soft Stowage items only.</i> | | Designed to meet the standard modular locker stowage requirements of NSTS 21000-IDD-MDK or equivalent IDD ____ . | | <input type="checkbox"/> | Reference AMS-02-F01, Structural Failure of Hardware | | |
| 2. Structural Failure of Sealed Containers Note 1: Only sealed containers made of conventional metal (metal alloy) can use the 1230 form. Sealed containers made of unconventional metals or non-metallic materials shall be documented on Unique Hazard Reports. Note 2: The 1230 form is not applicable for “sealed container”(s) employed in levels of containment control of hazardous fluid. | | Sealed containers must meet the criteria of NASA-STD-5003, Para. 4.2.2.4.2.3a, contain a substance which is not a hazard if released, be made of conventional metals (e.g. Al, Inconel, monel, steel or titanium), contain less than 14,240 foot-pounds (19,130 Joules) of stored energy due to pressure, and have a maximum delta pressure of 1.5 atm. | | <input type="checkbox"/> | This hazard is not applicable, the AMS-02 does not make use of sealed containers within its design | | |
| APPROVAL | | PAYLOAD ORGANIZATION | | | SSP/ISS | | |
| PHASE I | | | | | | | |
| PHASE II | | | | | | | |
| PHASE III | | | | | | | |

A.21-1

| FLIGHT PAYLOAD STANDARDIZED HAZARD CONTROL REPORT | | A. NUMBER | B. PHASE | C. DATE |
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| D. PAYLOAD, DTO, DSO or RME (Include Part Number(s), if applicable) | | HAZARD TITLE | | E. VEHICLE |
| Alpha Magnetic Spectrometer –02 (AMS-02) (Exterior Elements) | | STANDARD HAZARDS | | Shuttle/Station |
| F. DESCRIPTION OF HAZARD: | G. HAZARD CONTROLS: (complies with) | H. APP. | I. VERIFICATION METHOD, REFERENCE, AND STATUS: | |
| 3. Structural Failure of Vented Containers | <p>For intentionally vented containers, vents are sized to maintain a 1.4 factor of safety for Shuttle or a 1.5 factor of safety for Station with respect to pressure loads. Meets all of the applicable pressure rates defined for one or more of the following.</p> <p>a) Shuttle payload bay – ICD 2-19001, Para. 10.6.1</p> <p>b) Station environment – SSP 52005, paragraph 4.3 or equivalent payload specific ICD ____.</p> <p>c) Station PFE discharge – SSP 57000, Para. 3.1.1.4K, or equivalent payload specific ICD ____.</p> <p>d) Shuttle Middeck – NSTS 21000-IDD-MDK, Section 6.1.</p> | <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> | <p>3.a.1. SVM: Review of Design to demonstrate compliance with ICD 2-19001 paragraph 10.6.1</p> <p>3.a.1 STATUS: Open. AMS-02 Chief Engineer Report on AMS-02 Venting</p> <p>Note: Attachments to STD-AMS-02-F01 includes a tabulation of vented containers and compartments and the features and verification for each that will be considered in the Chief Engineer's Report.</p> | |
| 4. Sharp Edges, Corners, and/or Protrusions. | <p>Meets the <u>intent</u> of one or more of the following:</p> <p>a) NASA-STD-3000 / SSP 50005</p> <p>b) SLP 2104</p> <p>c) NSTS 07700 Vol. XIV App. 7 (EVA hardware)</p> <p>d) NSTS 07700 Vol. XIV App. 9 (IVA hardware) / SSP 57000</p> <p>e) SSP 41163, Para. 3.3.6.12.3 (EVA), Para. 3.3.6.12.4 (IVA).</p> | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> | <p>Reference AMS-02-F14, EVA Operations Hazard</p> <p>NOTE: there are sharp edges on the star tracker baffle that can not be eliminated from the design; use of JSC Form 1230 is not applicable due to this design feature.</p> | |

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| D. PAYLOAD, DTO, DSO or RME (Include Part Number(s), if applicable) | | HAZARD TITLE | | E. VEHICLE |
| Alpha Magnetic Spectrometer –02 (AMS-02) (Exterior Elements) | | STANDARD HAZARDS | | Shuttle/Station |
| F. DESCRIPTION OF HAZARD: | G. HAZARD CONTROLS: (complies with) | H. APP. | I. VERIFICATION METHOD, REFERENCE, AND STATUS: | |
| 5. Shatterable Material Release | a) All materials are contained. b) Optical glass (i.e. lenses, filters, etc.) components of crew cabin experiment hardware that are non-stressed (no delta pressure) and have passed both a vibration test at flight levels and a post-test visual inspection. c) Payload bay hardware shatterable material components that weigh less than 0.25 lb and are non-stressed (no delta pressure) or non-structural. | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> | Reference AMS-02-F16, Shatterable Material Release. Hardware exists in Orbiter payload bay and on ISS exterior, the latter condition not addressed in JSC Form 1230. | |
| 6. Flammable Materials | a) A-rated materials selected from MAPTIS, or b) Flammability assessment per NSTS 22648 | <input type="checkbox"/> <input type="checkbox"/> | Reference AMS-02-F10, Flammable Materials in Payload Bay | |
| 7. Materials Offgassing | Offgassing tests of assembled article per NASA-STD-6001 (previously published as NHB 8060.1C). | <input type="checkbox"/> | N/A- Exterior elements only in this hazard report | |
| 8. Nonionizing Radiation 8.1 Non-transmitters | Meets all that apply: a) Pass ICD-2-19001, 10.7.3.2.2 / SSP 30238 EMI compatibility testing, or b) NSTS/USA approved analysis ICD Section 20, or c) ISS/EMEP approved TIA d) Meets SSP 41163, Para. 3.3.6.6 and SSP 50094, Para. 3.4. | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> | Reference AMS-02-F07, Excessive Radiated Field Strengths, EMI, Magnets. Hardware exists in payload bay and on ISS exterior, the latter condition not addressed in JSC Form 1230. | |
| 8.2Lasers NOTE: Lasers operating at class levels 3b and 4, meeting ANSI Z136.1, shall be documented on Unique Hazard Reports. | Meet ANSI Z136.1-2000 for class 1, 2, or 3a Lasers (as measured at the source). | <input type="checkbox"/> | Reference Hazard Report AMS-02-F20, Crew Exposure to Coherent Light | |

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|--|--|---|--|--|--|----------------|--|
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| D. PAYLOAD, DTO, DSO or RME <i>(Include Part Number(s), if applicable)</i> | | HAZARD TITLE | | | E. VEHICLE | | |
| Alpha Magnetic Spectrometer -02 (AMS-02) (Exterior Elements) | | STANDARD HAZARDS | | | Shuttle/Station | | |
| F. DESCRIPTION OF HAZARD: | | G. HAZARD CONTROLS: <i>(complies with)</i> | | H. APP. | I. VERIFICATION METHOD, REFERENCE, AND STATUS: | | |
| 9.1 Alkaline cells and batteries made of alkaline cells, connected in series or in parallel, up to 12 V and with up to 60 Watt-hours capacity, no potential charging source and cells are not in a gas-tight compartment. | | Cells and batteries pass acceptance tests that include loaded and open circuit voltage measurements, visual examination, and leakage check under vacuum (e.g. 6 hours at 0.1 psia). | | <input type="checkbox"/> | Reference AMS-02-F13, Battery Failure Submission of EP-Form-03(including the form's approved reference number) for EP5 approval Information to be included on the EP5 reviewed/approved Form-03: application and protective circuit schematics | | |
| 9.2 Primary button cells such as Li-(CF)x, Li-iodine, LiV ₂ O ₅ , LiMnO ₂ , Ag-Zn and rechargeable button cells such as LiV ₂ O ₅ , Li-ion, Ni-Cd, Ni-MH, Ag-Zn cells or batteries, which have a capacity of 300 mAh or less and no more than 3 cells per common circuit, and cells are not in a gas-tight compartment. | | Cells and batteries pass acceptance tests that include loaded and open circuit voltage measurements, visual examination, and leakage check under vacuum (e.g. 6 hours at 0.1 psia). Note: Above acceptance testing for button cells in Section 9.2 which are soldered to a circuit board in commercial equipment (not applicable to those button cells in a spring-loaded clip) is limited to a functional check of the equipment utilizing the subject battery. | | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> | Reference AMS-02-F13, Battery Failure Submission of EP-Form-03(including the form's approved reference number) for EP5 approval Information to be included on the EP5 reviewed/approved Form-03:: application and protective circuitry. | | |
| 9.3 COTS NiMH, NiCd and Ag/Zn cells and batteries for IVA use up to 20 V and 60 Wh | | Cells and batteries purchased in one lot; pass acceptance tests that include loaded and open circuit voltage measurements, visual examination, leakage check under vacuum (e.g 6 hours at 0.1psia) and vibration to workmanship levels with functional checks which include charge/discharge cycles for rechargeable batteries. | | <input type="checkbox"/> | Reference AMS-02-F13, Battery Failure Submission of EP5 Form-03(including the form's approved reference number) for approval Information to be included on the EP5 reviewed/approved Form-03: manufacturer's specification, battery protective features and charger schematics | | |

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|--|--|--|--|----------|-----------------|----------------|--|
| | | STD- AMS-02-F01 | | Phase II | | March 31, 2006 | |
| D. PAYLOAD, DTO, DSO or RME (Include Part Number(s), if applicable) | | HAZARD TITLE | | | E. VEHICLE | | |
| Alpha Magnetic Spectrometer –02 (AMS-02) (Exterior Elements) | | STANDARD HAZARDS | | | Shuttle/Station | | |
| F. DESCRIPTION OF HAZARD: | G. HAZARD CONTROLS: (complies with) | H. APP. | I. VERIFICATION METHOD, REFERENCE, AND STATUS: | | | | |
| 9.4 COTS Li-ion batteries up to 10 V and 60 Wh for IVA use | Batteries and charger shall be from a single lot; shall show one-fault tolerance at battery level and shall pass acceptance tests that include loaded and open circuit voltage measurements, visual examination, leakage check under vacuum (e.g 6 hours at 0.1psia) and vibration to environment or double the workmanship level, whichever is higher; and functional checks which include charge/discharge cycles. | <input type="checkbox"/> | Reference AMS-02-F13, Battery Failure Submission of EP-Form-03(including the form's approved reference number) for EP5 approval. Information to be included on the EP5 reviewed/approved Form-03: battery protective features and charger features Note: For hardware using batteries, and/or chargers additional levels of control shall be provided by the hardware | | | | |
| 10. Touch Temperature | a) Within IVA touch temperature range of –18 Degrees C. (0 Degrees F.) and 49 Degrees C. (120 Degrees F.) and satisfies the intentional contact constraints of letter MA2-95-048 (if applicable). b) Meets EVA touch temperature criteria of NSTS 07700 Vol. XIV App. 7. | <input type="checkbox"/> <input type="checkbox"/> | Reference AMS-02-F14, EVA Operations Hazard | | | | |
| 11. Electrical Power Distribution | a) Shuttle-powered payloads – Meets all circuit protection requirements of Letter TA-92-038. b) Station-powered payloads – Meets station interface circuit protection requirements of SSP 57000 and payload circuit protection requirements of Letter TA-92-038. | <input type="checkbox"/> <input type="checkbox"/> | Reference AMS-02-F17, Electrical Power Distribution Damage. JSC Form 1230 does not address power supplied by exterior circuitry of ISS or power received by SSRMS. | | | | |
| 12. Ignition of Flammable Atmospheres in Payload Bay | All ignition sources in the Payload bay, for launch and landing, are controlled as required in Letter NS2/81-MO82, and MLI grounded per ICD 2-19001. | <input checked="" type="checkbox"/> | 12.1.1 SVM: Review of Design to confirm no arcing/sparking components powered during ascent. 12.1.2 SVM: Thermal analysis to confirm no component will operate or fail exceeding autoignition temperature 12.1.3 SVM: Grounding testing of MLI 12.1.1 STATUS: Open. 12.1.2 STATUS: Open. 12.1.3 STATUS: Open. | | | | |

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|---|---|--|--|-----------------|-------------------|----------------|--|
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| D. PAYLOAD, DTO, DSO or RME <i>(Include Part Number(s), if applicable)</i> | | HAZARD TITLE | | | E. VEHICLE | | |
| Alpha Magnetic Spectrometer –02 (AMS-02) (Exterior Elements) | | STANDARD HAZARDS | | | Shuttle/Station | | |
| F. DESCRIPTION OF HAZARD: | G. HAZARD CONTROLS: <i>(complies with)</i> | H. APP. | I. VERIFICATION METHOD, REFERENCE, AND STATUS: | | | | |
| 13. Rotating Equipment | Rotating equipment meets criteria of NASA-STD-5003 for obvious containment. | <input checked="" type="checkbox"/> | 13.1.1 SVM: Fracture Control Summary 13.1.1 STATUS: Open | | | | |
| 14. Mating/demating powered connectors | a) Meets the low power criteria of letter MA2-99-170 or, b) Meets the paragraph 1 criteria of letter MA2-99-170 (e.g., IVA and open circuit voltage no greater than 32 volts). | <input type="checkbox"/> <input type="checkbox"/> | Reference AMS-02-F12 , Mate/Demate of Connectors | | | | |
| 15. Contingency Return and Rapid Safing | Shuttle Environment: a) If middeck payload – can be stowed within 50 min. (see paragraph 3 of letter MA2-96-190). b) If SPACEHAB transfer item – can establish a safe for return configuration within 3 min. (see paragraph 5 of letter MA2-96-190). Station Environment: c) Payload design does not impede emergency IVA egress to the remaining adjacent pressurized volumes. | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> | Reference AMS-02-F18, Rapid Safing/Payload Reconfiguration | | | | |
| 16. Release of Mercury from bulbs into crew habitable environment. | a) Mercury vapor bulbs contain less than 30 mg of Mercury per bulb, and b) No more than one bulb could break due to a single failure. | <input type="checkbox"/> <input type="checkbox"/> | N/A – This hazard report addresses only exterior elements – No elemental mercury is used in AMS-02 | | | | |

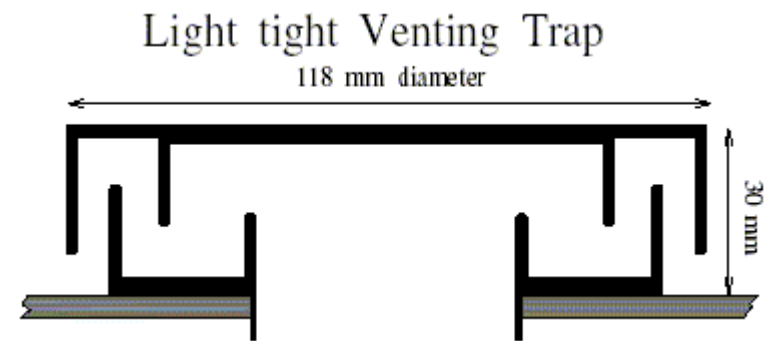
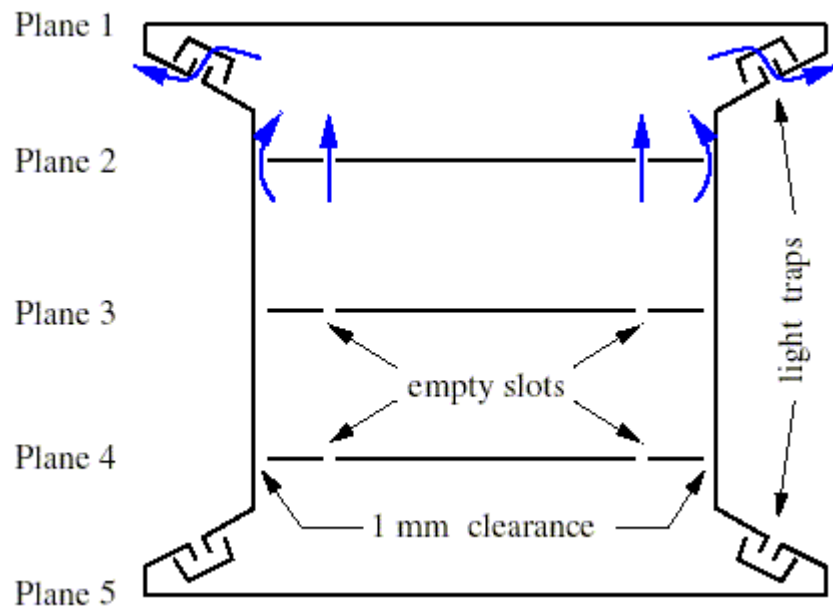
A.21-6

Vented Containers/Structures

| Ref | Item | Function | Control Method | Verification Method | Verification Status |
|------------|--------------------------------|--|---|---|---|
| Structures | USS-02 | Primary Structural Path. Composed of closed aluminum beams | Vented, but will be analyzed as if closed and with margins to retained atmosphere. | Structural Analysis | Open. |
| Avionics | Avionics Crates | Contain avionics | Vented | Venting Analysis | Closed. AMS-02-RP-CGS-005. Nov 12, 2004 |
| Avionics | XPD (Power Distribution) Boxes | | Vented | Venting Analysis | Closed. AMS-02-RP-CGS-005. Nov 12, 2004 |
| Avionics | HVB (High Voltage Boxes) | High voltage power sources | Fully Potted No volume to vent | | |
| Avionics | Cryomagnet Avionics Box | Controls charging/discharging of the AMS-02 Superconducting Magnet | Vented | Venting Analysis | Open |
| UPS | Battery Box | Contains battery and battery control electronics. | Vented | Venting Analysis | Open |
| MLI | MLI/thermal blankets | Thermal protection | MLI/blanket assembly will use standard means of venting layers and will use standoffs to provide venting across MLI/Blanket areas | Review of Design Inspection of as built hardware | Open |
| TRD | TRD Octagon Structure | Structure to support TRD sensor proportional tubes | VENTED. Structure is heavily perforated to support sensor tubes. Numerous paths for venting exit | Venting Analysis | Closed. Venting Analysis Complete |
| TRD | TRD Honeycomb Panels | Secondary Structure | VENTED. Panels are perforated (cover and core) and the panels have holes on the outside of the panels 1mm in diameter to enable venting the interior. | Testing/Analysis of Pressure Retention Potential | Closed. Pull tested completed, showed Margin of Safety of 6.2 with a FoS of 2.0 RWTH Report – Venting of Honeycomb Panels |
| TRD | Cabling Grid Tubes | Support Cabling runs | VENTED. 1 mm holes every 30 cm along length | Inspection of as built hardware | Open |
| ACC | ACC Connector | Connector for Fiber Optics Connection | VENTED. Filtered (open cell foam) Vents provided | Inspection of as built hardware | Open |
| ACC | ACC PMT Housing/Box | Covers PMT and Fiber Optics Connections | VENTED. Filtered (open cell foam) Vents provided | Inspection of as built hardware | Open |
| TOF | TOF paddles | Detector | Venting channel provided, wrapped paddles do not create a hazardous condition if venting blocked | Inspection of as built hardware | Open |

| Ref | Item | Function | Control Method | Verification Method | Verification Status |
|--------------|-------------------------|---|---|---|--|
| TOF | TOF PMT | Detector | Minimum interior free volume for gas, design is not gas tight | Inspection of as built hardware | Open |
| Tracker | Tracker Volume | Sensor Volume | Vented through 4 bell shaped labyrinths (light tight traps) with nominal section of 20cm ² to vent the 1.14m ³ volume | Venting Analysis Inspection of as built hardware | Closed. Venting Analysis Complete September 29, 2004, Depressurization and Repressurization Loads on AMS-02 Tracker Structure. |
| Tracker | Tracker Honeycomb | Secondary Structure | VENTED. Panels are perforated (cover and core) and the panels have holes on the outside of the panels 1mm in diameter to enable venting the interior. | Testing/Analysis of Pressure Retention Potential | Closed. Pull tested completed, showed Margin of Safety of 6.2 with a FoS of 2.0 RWTH Report – Venting of Honeycomb Panels |
| Star Tracker | Star Tracker Enclosure | Enclosure and Support for Star Tracker Electronics and Optics | Volume vented by 14 fastener access holes | Review of Design Inspection of as built hardware | Open |
| RICH | Aerogel & NAF Container | Contain particle Cherenkov generating materials | Vented. 0.17 m ³ volume vented (out) through 4 1 psi vent valves and 50 µm filter. Vented (in) through 3 1 psi vent valve | Venting Analysis Inspection of as built design | Open |
| RICH | RICH Detector | Sensor and reflective surface free volume | Vented. 0.7m ³ vented through eight 15 mm holes. | Venting Analysis Inspection of as built design | Open |
| RICH | RICH PMT | Detector | Minimum interior free volume for gas, design is not gas tight | Inspection of as built hardware | Open |
| ECAL | ECAL PMT | Detector | Minimum interior free volume for gas, design is not gas tight | Inspection of as built hardware | Open |
| ECAL | Backpanels | Support to PMT | Volume vented through 4 labyrinth groves (1mmx 0.5 mm) to vent volume of 0.03 m ² | Review of Design Inspection of as built hardware | Open |

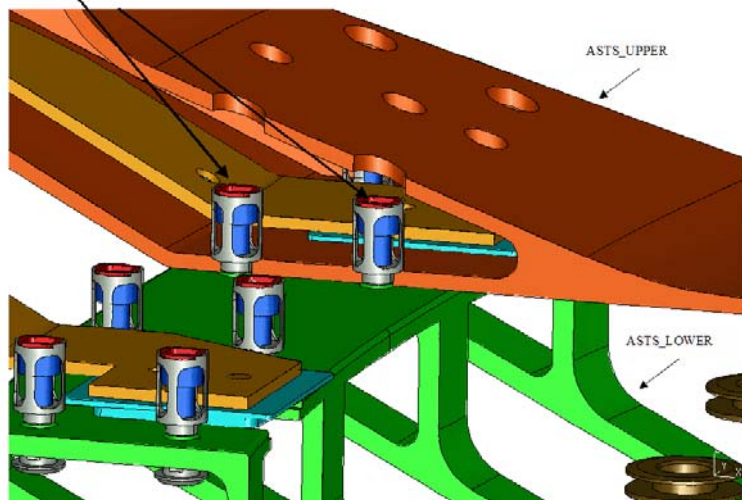
NOTE: All verifications will be tabulated and documented closed in the Chief Engineer's Report on Venting and will be tracked internally within the AMS-02 project, but only single verification will be documented for safety closure, provided by the Chief Engineer.



AMS-02 Largest Vented Volume is the Silicon Tracker.

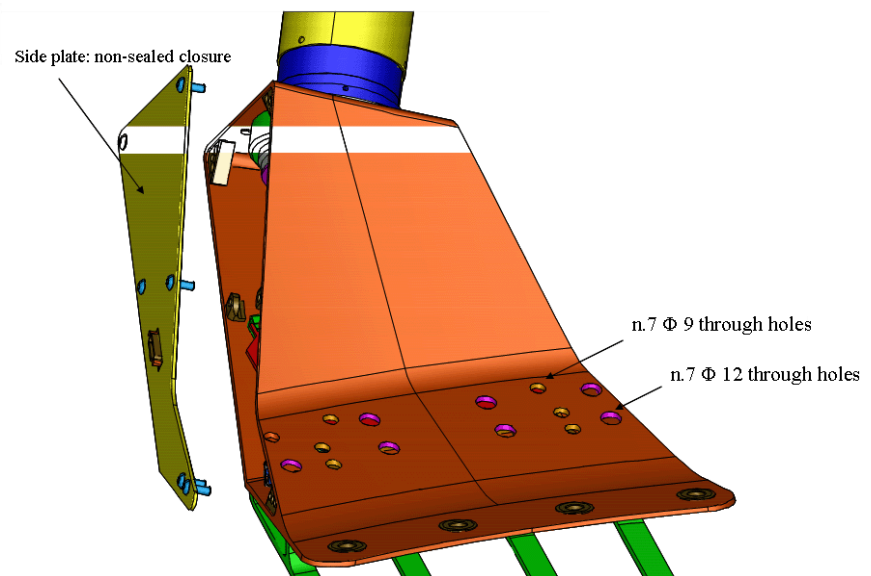
BOLTS CONNECTING ASTS UPPER TO LOWER IN UNSCREWED POSITION AND HOUSED IN A DEVOTED CAGE THAT TAKE IN PLACE THE BOLTS DURING INSTALLATION

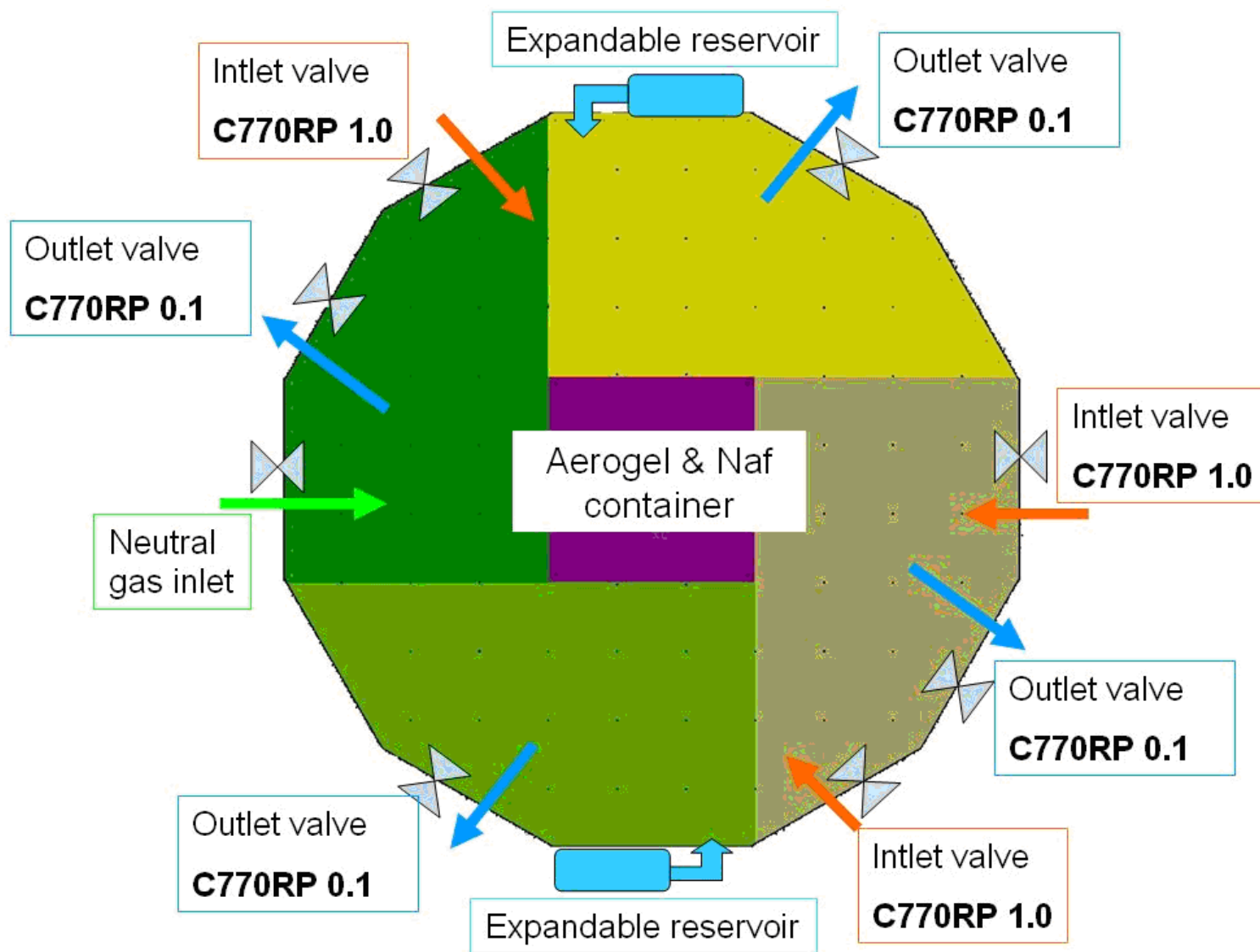
Venting holes will be used only for screwdriver acces



Star Tracker Enclosure Venting

Tracker Vent Design



**RICH Functional Venting Design**

IGNITION SOURCES DURING ASCENT/DESCENT

DURING ASCENT THE FOLLOWING ITEMS ARE POWERED

- Cryogenic Vent Valve (operates at baroswitch command or Shuttle computer command when exterior pressure is 5 mbar (0.04 psia)
- Baroswitch for operating Cryogenic Vent Valve (operates at 5 mbar (0.04 psia)
- Uninterruptible Power Supply Battery and Battery Circuit. Battery is operational at all times. No charging occurs.

| Item | Issue | Compliance Method | Verification | Status |
|--|------------------------------|---|---|--------|
| Cryogenic Vent Valve | Arcing/Sparking Potential | Sealed Electromechanical Components within Valve | Review of Design, manufacturer's specifications | Open |
| Cryogenic Vent Valve Operating Baroswitch | Arcing/Sparking Potential | Sealed electronics | Review of Design, manufacturer's specifications | Open |
| Cryogenic Vent Valve Drive Circuitry | Arcing/Sparking Potential | No arcing/sparking components. Low Temperature Surfaces | Review of Design. Functional Testing | Open |
| Uninterruptible Power Supply Battery and Battery Circuit | Arcing/Sparking Potential | No arcing/sparking components. Low Temperature Surfaces | Review of Design. Thermal Analysis/Functional Testing | Open |
| AMS-02 (Integrated) | Excessively high temperature | Low Temperature Surfaces | AMS-02 Thermal Analysis | Open |

Note: Individual verifications of the preceding table will be tabulated and documented in unified verification closures documented on the 1230 Form.

ROTATING EQUIPMENT

| System | Rotating Equipment | Rotational Speed | Diameter | Control/Fracture Classification | Verification |
|------------|-----------------------------|--|---|---|---|
| TRD | Gas pumps (2) KNF NMP830 | 240 RPM | (15 gram rotating mass, small diameter) | Contained within Box C Vessel, Low Energy | Review of Design Fracture Control Assessment |
| TTCS | Pumps (4) | 9000 RPM Maximum | 0.5 inch | Contained, Low Energy | Review of Design Fracture Control Assessment |
| Cryosystem | Pump (vacuum pump) | 1500 RPM Maximum, 500-1500 RPM Operational Ground Operations Only | 90 mm, 0.512 Kg | Contained, Low Energy | Review of Design Fracture Control Assessment |

Note: Individual verifications of the preceding table will be tabulated and documented in unified verification closures documented on the 1230 Form.



PDT Model 5319-1, Centrifugal Pump, CO₂ **Rotating Mass Data**

The CO₂ circulation pumps that are to be installed on the AMS2 each contain the following rotating masses:

| | | |
|------------------------|-------------------|--------------------|
| Rotor Assembly: | 0.034 lbs | (0.544 oz) |
| Impeller: | 0.004 lbs | (0.064 oz) |
| Screw: | 0.0004 lbs | (0.0064 oz) |
| Total: | 0.0384 lbs | (0.614 oz) |

The above listed rotating masses are contained in a 304L stainless steel housing that has a minimum wall thickness of 0.118 inches. The housing is designed to withstand an internal burst pressure of 400 BAR, (5800 psig).

The Rotor Assembly, the larger of the rotating masses, is also contained within the motor stator assembly. The motor stator assembly laminations and windings have a thickness of 0.195 inches.

The maximum radius of the rotating mass is 0.250 inches.

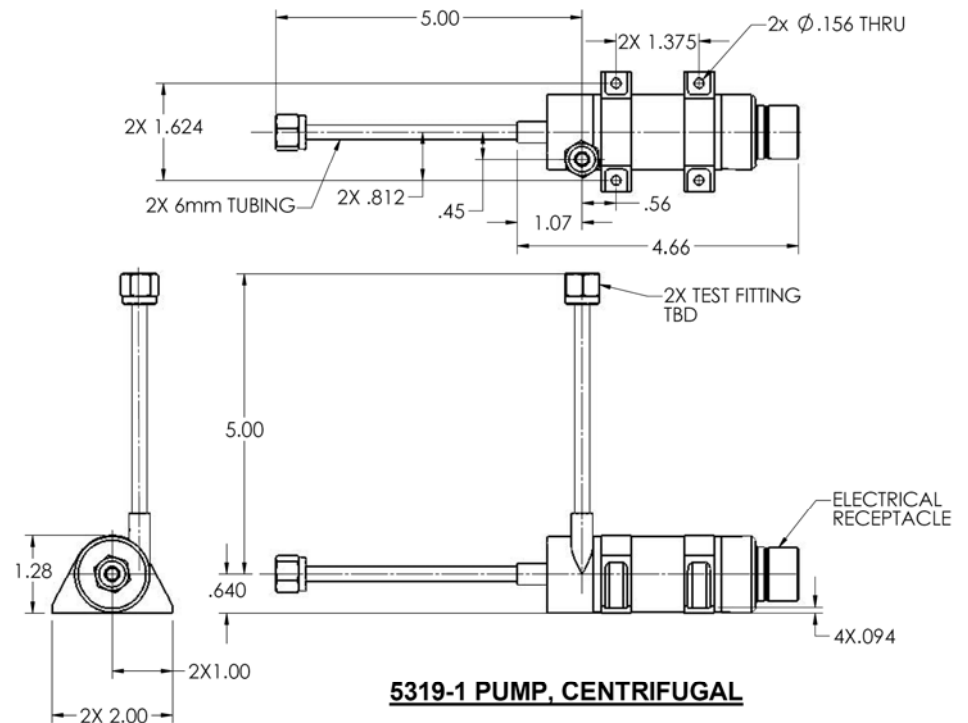
The maximum rate of rotation is 9000 rpm.

Following is the outline drawing of the pump and controller assemblies:

For more information please contact:

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Manager, Engineering & Programs
Pacific Design Technologies, Inc.
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Goleta, CA 93117

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805 961-9110



5319-1 PUMP, CENTRIFUGAL

DESIGN NOTES

1. FLUID: LIQUID CARBON DIOXIDE
2. FLOWRATE:
MINIMUM: 2 ml/sec AT 150 mBAR dP AT + 25°C
MAXIMUM: 4 ml/SEC AT 850 mBAR dP AT + 25°C
3. OPERATING VOLTAGE:
28 VDC ± 4 VDC
4. TEMPERATURE:
PUMP:
OPERATING: -50°C TO + 25°C
AMBIENT STORAGE: -60°C TO +80°C
CONTROLLER:
OPERATING: -20°C TO + 55°C
AMBIENT STORAGE: -40°C TO +80°C
5. PRESSURE
MAXIMUM OPERATING: 160 BAR (2320 PSIG)
PROOF: 240 BAR (3480 PSIG)
BURST: 400 BAR (5800 PSIG)
PUMP INLET: 10 PSIG ABOVE SATURATED LIQUID PRESSURE
6. INPUT POWER:
10 WATTS @ NOMINAL FLOW CONDITION AS A GOAL
7. LIFETIME:
3 YEARS NOMINAL
9. LEAK RATE:
LESS THAN 1 X 10-8 mBAR
*L/S CO₂ AT 160 BAR
10. WEIGHT:
2X 5319-1 PUMP: 2.20 LBS
5356-2 CONTROLLER: 2.44 LBS
60908 HARNESS ASSEMBLY: 2.10 LBS
(HARNESS NOT SHOWN)

Stand alone and backing pump for turbopumps

Product

MVP 020-3DC

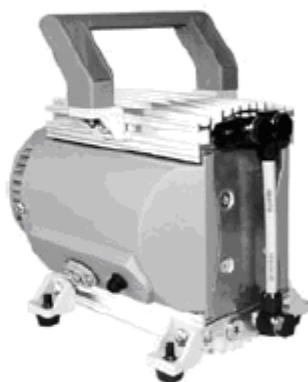
MVP 020-3DC, Diaphragm pump, 24 V +/- 10 %

Characteristics

| | |
|------------------------------------|---------------|
| Ultimate pressure | < 2 mbar |
| Mains requirement: voltage (range) | 24 V +/- 10 % |
| Switch | no |

Note:

The offered cable, part number: PM 051 103 -T, corresponds to the connection cable between the power supply TPS 150, 24 V DC and the Diaphragm pump MVP 020-3 DC.



Similar product

- Backing pump and stand alone pump for turbopumps.
- Completely oil free! Very quiet, noise level approx. 48 dB(A). Long service life of diaphragms and valves. Pumping of dry and non corrosive gases. Interval operation and rotation speed control.

Flanges

Flange (in): DN G 1/8" Hose nipple DN 6

Flange (out): DN G 1/8" Silencer

Technical data

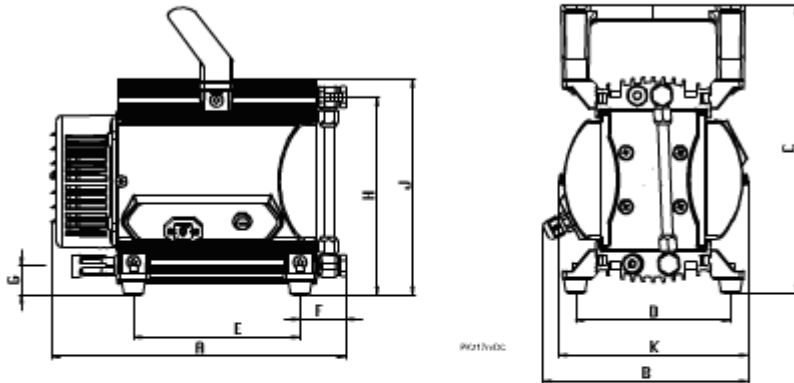
| | |
|-----------------------------|-----------------------------|
| Rotational speed max. | 1500 rpm |
| Pumping speed at 1500 min-1 | 1 m ³ /h |
| Ultimate pressure | < 2 mbar |
| Exhaust pressure max. | 1,1·10 ³ mbar |
| Leak rate | 1·10 ⁻¹ mbar l/s |
| Motor rating | 64 W |
| Current max. | 3,5 A |
| Noise level | 48 dB (A) |
| Ambient temperature | 12-40°C |
| Weight | 4,1 kg |

Note:

The offered cable, part number: PM 051 103 -T, corresponds to the connection cable between the power supply TPS 150, 24 V DC and the Diaphragm pump MVP 020-3 DC.

Cryomagnet Vent Pump Specifications

Dimensional Diagram



Large view

A: 223 mm B: 155 mm C: 217 mm D: 117 mm
 E: 126 mm F: 35 mm G: 22 mm H: 149 mm
 J: 163 mm K: 143 mm

From Pfeiffer vacuum, the supplier of the Cryomagnet vent pump.

1. A description of the rotating mass - a round steel housing with 4 mm wall thickness with an annular permanent magnet 82mm X 71.5mm, length 20mm
2. Diameter - the diameter of the motor - 90 mm
3. The rotating mass - 0.512 kg
4. Maximum speed - 1500 rpm
5. Controlled speed - 500 - 1500 rpm (with variable DC input)
6. Compliance assessment to the Fracture Control requirements for rotating equipment - no further precautions are necessary due to the low rotational speed (1500 rpm) and the robust construction (4mm wall thickness)

Cryomagnet Vent Pump Specifications